



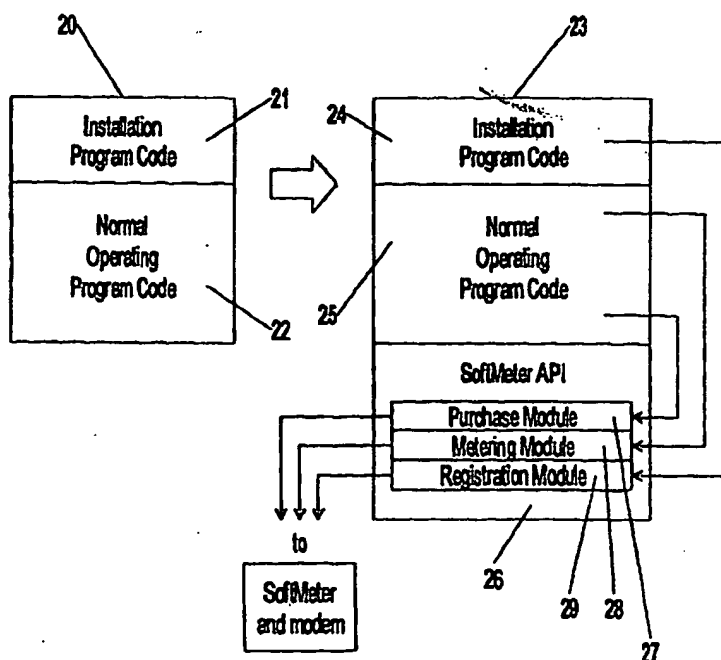
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G06F 9/44, 9/445		A1	(11) International Publication Number: WO 95/34857
			(43) International Publication Date: 21 December 1995 (21.12.95)
(21) International Application Number: PCT/US95/07587		(81) Designated States: AU, CA, JP, MX, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(22) International Filing Date: 14 June 1995 (14.06.95)			
(30) Priority Data: 08/259,590 14 June 1994 (14.06.94) US		Published With international search report.	
(71)(72) Applicants and Inventors: SMITH, James, P. [US/US]; Apartment 187, 2330 Vehicle Drive, Rancho Cordova, CA 95670 (US). SMITH, Edward, A. [US/US]; 25052 Wilkes Place, Laguna Hills, CA 92653 (US).			
(74) Agents: DIPPERT, William, H. et al.; Cowan, Liebowitz & Latman, P.C., 1133 Avenue of the Americas, New York, NY 10036-6799 (US).			

(54) Title: APPARATUS AND METHOD FOR CONTROLLING THE REGISTRATION, PAID LICENSING AND METERED USAGE OF SOFTWARE PRODUCTS

(57) Abstract

An apparatus and method for controlling the registration of installation, licensing and metered usage of software products is provided (23). The invention, called the "SoftMeter" system and process, requires the registration of a software product with the SoftMeter system clearinghouse prior to the installation of the software in the user's personal computing device and prior to any use by the user of that software (29). The invention further requires the purchase by the user of a specified amount of use according to predetermined units-of-use and requires the metering down to zero of the amount of the user's remaining use from the prepaid amount of use as the user uses the software (28). The SoftMeter system also has a device that notifies the user as his remaining prepaid use approaches or reaches zero. The registration and purchase processes are accomplished via a telephone transmission device, such as a data modem, and operate much like a standard credit card purchase. The SoftMeter system consists of elements including an Actualizing Device, Interchangeable Software, a tamperproof persistent Storage Device, an Interlock Device and a Purchase Transmission Device, all of which must be in the control and possession of the user.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

APPARATUS AND METHOD FOR CONTROLLING THE REGISTRATION,
PAID LICENSING AND METERED USAGE OF SOFTWARE PRODUCTS

5 Field of the Invention

 This invention relates to the use of software products. More particularly, this invention relates to an apparatus and method for controlling the registration, paid
5 licensing and metered usage of software products. Both the apparatus and method are generic in nature; there are several ways in which they can be implemented with novel and non-obvious combinations of existing technology.

Background of the Invention

10 The technology of the compact disc (CD), used to distribute audio material to the consumer market, has been applied to the personal computer industry in the form of the CD-ROM, which is physically identical to its audio predecessor but contains data and software rather than
15 music. The promise of this medium of distribution is overwhelming in its implications. One CD-ROM can hold 650 million characters of information -- about 30,000 typewritten pages -- and costs less than \$5 to manufacture. However, the prices of these CD-ROMs are proportioned to
20 suit the value placed on them only by their primary market. For example, a legal publisher may sell all the California legal forms for pleading and practice on a CD-ROM for \$4000, and a medical publisher may sell a subscription of CD-ROMs containing copies of all cardiology journals
25 printed since the beginning of modern medicine for \$8000 per year. These prices, however, are too steep for most junior colleges and are totally out of the question for casual home or business users.

Thus, the problem is that publishers of CD-ROMs do not sell their products at prices proportional to the amount of use that their customers would make of them. For example, a lawyer would pay \$4000 for his legal reference works on CD-ROM because he would use them every day of the week; however, a casual user would pay only \$40 to use the CD-ROM five or six times a year. Then both users could have their own copies of the CD-ROMs available for use whenever needed.

The same basic problem has existed in the PC software industry for years, and the solution was simple: illegal copying. A User who wanted to have a \$400 software package available merely for occasional use simply borrowed a legally purchased copy from a friend or from a place of work, took it home and made an illegal copy onto \$5 worth of floppy disks. The user then went to a bookstore and purchased an after-market "how-to-use" book for \$24 and, in total net effect, got his own copy of the \$400 package for \$29 -- a price that was reasonably proportional to his level of intended use. This "market solution," however, does not work for CD-ROMs simply because it would take some six-hundred floppy disks to copy one CD.

Thus, it is desirable to enable consumers to pay software license fees that are reasonably proportional to the value of the beneficial use of the software, rather than the present approach of paying either "full price" or nothing at all. It is also desirable to enable the consumer to have possession and control of the software such that the user can access any of the software at his own demand and convenience while paying for only the portion actually used.

Neither Pay-per-view Cable Television nor the much-discussed "data superhighway" fulfills the traditional consumer's need and desire for possession and control or provides the benefits of low-cost convenience and

accessibility. A user who desires a library of reference works, for example, movies on CD-ROM, would not be satisfied by using either Cable-TV or the data superhighway. Having a choice among 500 movies available for viewing between 8 and 10 p.m. Saturday night does not fulfill the desire to "watch any movie I want, whenever I want to watch it." In addition, the data superhighway will not allow the user to stop the movie at his convenience to allow for a food or rest room break. Pay-per-view also is not sufficient because the consumer does not have control and possession of all of the elements. He does not control and possess his own, personal copies of the reference materials or software. He can access only the programs piped into his home under the control of the cable operators and only at those times of day when the cable operators choose to offer them.

Another device thought to solve this problem is a software key, which is a small device built inside a 25-pin connector shell and which contains an integrated circuit chip that will respond only when a special serial number is written to it by the software. This device is plugged into the back of a personal computer, into one of the connectors used for attaching a printer. When software that is "locked" is loaded, the software writes its special serial number to the device and checks for a response. Receipt of a response indicates the presence of the key, such that the software can proceed to operate. If the key is absent, the software will not operate. Although the software may be copied (legally or illegally), because the key cannot be duplicated and because the software remains locked without it, the problem of software piracy is effectively eliminated. However, this "key" approach is deficient in two major areas. First, the software key does not lend itself to universal use because a different key is required for each software product. If this method were applied to

all products installed on a typical user's machine, the "daisy chain" of software key devices would be long enough to wrap twice around a building. And second, the software key does not enable the cost of a software package to be proportional to its use. The user must still pay full price for the product even if he intends to use it on an infrequent basis. Thus, the software key serves primarily as a locking device but not much more.

Software encryption has recently been used in two contexts in an attempt to solve the proportional pricing problem. One context offers a CD-ROM containing several hundred files of fonts (typefaces). When a user wants to purchase a new font, he calls an 800 number and exchanges his credit card number for a special "decryption key" number that can be used to decrypt only the desired file. From a "user convenience" standpoint, this method is quite effective in such a specific application. The "software" consists of specialized data files, not all of which are likely to be of interest to all purchasers. Thus, the distribution medium (CD-ROM) is purchased once at a small fee, and then additional fees are charged to acquire the unlimited use of each component stored on that disk, one at a time, only when such a component is really needed. The same technique would apply equally well to geographical data, demographic data and other types of data collections, of which any given user would make intensive use of only small segments and have no interest in the other stored data.

However, several inherent aspects of the encryption method limit its usefulness to "data file" oriented products. Once a particular file has been decrypted, it may be accessed by all other software in an unrestricted way. In addition, once the file is "in the clear," it can be freely and illegally copied (this is an inherent aspect of "data" that is sold for use with a variety of other

software). Moreover, because the data can be accessed in a useful manner from so many other unrelated software products, there is no practical method for metering its use. Thus, because this method embodies no metering, the
5 lock-out mechanism is a "one-time affair" and illegal copying is still enabled. Software encryption in this context does not solve the problems discussed above.

Most recently, the software encryption method has also been used to implement a concept called "TryWare." TryWare
10 offers several (ten to twenty) different complete software packages, all on one CD-ROM. The user is invited to try all of the packages and to purchase only those that he finds useful. The purchase is handled the same way as for the data file CDs: in exchange for making a charge for the
15 full retail price of the package, the user is given a decryption key that will allow the software to be decoded and transferred to his hard disk. The gimmick is that the software packages are all provided on the CD-ROM in "crippled" form -- that is, crucial sections of the
20 programs are encrypted, just enough to negate the real-life usefulness of the TryWare packages. For example, the ability of the package to save a file or to print a file may be restricted, or the largest document may be limited to just one page. To get full use of the package, the
25 buyer (or "tryer") must pay the full price for it. However, the TryWare approach provides nothing regarding proportional pricing or metering.

Objects of the Invention

This invention is intended to solve many problems and
30 to provide many benefits to software end-users, publishers and retailers.

It is one object of this invention to eliminate the economic incentive for making illegal copies of software products.

It is another object of this invention to enable users to pay software license fees that are reasonably proportional to the value received from using the software, rather than the present approach of paying either full price or nothing.

It is yet another object of this invention to provide publishers with an accurate, complete and up-to-date list of registered users of its software products.

It is still another object of this invention to make it economically viable for users to acquire many more software packages for experimental, evaluative, marginally justified, infrequent and/or non-mission-critical use.

It is a further object of this invention to provide a continuing revenue stream to software publishers.

It is yet a further object of this invention to provide comprehensive tracking and accountability of software use and purchasing in a corporate environment.

It is still a further object of this invention to dramatically reduce the unit inventory cost for software retailers, thereby encouraging them to stock more titles and, consequently, to generate greater foot traffic.

It is also an object of this invention to enable the realization of the CD-ROM's promise of cheap and abundant access to information.

Summary of the Invention

The above and other objects are accomplished in accordance with the principles of the invention by providing an apparatus and method for controlling the registration of installation, licensing and metered usage of software products. The invention, called the "SoftMeter" system and process, requires the registration of a software product with the SoftMeter system

clearinghouse prior to the installation of the software in the user's personal computing device and prior to any use by the user of that software. The invention further requires the purchase by the user of a specified amount of use according to predetermined units-of-use and requires the metering down to zero of the amount of the user's remaining use from the prepaid amount of use as the user uses the software. The SoftMeter system also has a device that notifies the user as his remaining prepaid use approaches or reaches zero. The registration and purchase processes are accomplished via a telephone transmission device, such as a data modem, and operate much like a standard credit card purchase. The SoftMeter system consists of elements including an Actualizing Device, Interchangeable Software, a tamperproof persistent Storage Device, an Interlock Device and a Purchase Transmission Device, all of which must be in the control and possession of the user.

Brief Description of the Drawings

The above and other objects and advantages of the invention will be apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which the reference characters refer to like parts throughout and in which:

FIG. 1 is a schematic representation of one embodiment of a SoftMeter device according to the present invention;

FIG. 2 is a schematic representation of the method for making a product compatible with the SoftMeter system;

FIG. 3 is a diagram of a registration process;

FIG. 4 is a diagram of a metering process;

FIG. 5 is a diagram of a purchase process;

FIG. 6 is a plan view of a new software distribution media, called a CD-Ring; and

FIG. 7 is a plan view of an embodiment of a structure to enable a CD player to read and write the CD-Ring.

5 Detailed Description of the Invention

 A first embodiment of the invention, known as the SoftMeter system and process, is a plug-in accessory board device for a personal computer, which device contains a small amount of random access memory (RAM) that is
10 protected from tampering and from power outages. When the SoftMeter device is first installed, software provided with it will ask the user for his name, address, charge card number and password. This information will be stored in the SoftMeter device memory. Because the SoftMeter process
15 requires that data be communicated over the telephone, the installation process will also confirm the existence of a data modem either on the SoftMeter board or elsewhere in the computer.

 Software products that are compatible with the
20 SoftMeter system will sell not for the usual retail price of software products, for example \$200 to \$400, but rather much more inexpensively, for example \$29 to \$39. These software products will include, buried inside their programs, special software modules that will "speak" to the
25 SoftMeter board.

 When a newly purchased software package is first installed on a user's computer, the software will write its publisher number and product number into the SoftMeter memory. The SoftMeter device will use the modem to dial
30 the 800 number for a central SoftMeter clearinghouse and will send a data message indicating that "Mr/Ms XXXXX, residing at YYYYY, is now a registered user of software product number NNN produced by publisher number MMM." As

an additional installation step, the SoftMeter device will be informed of the initial amount of metered use that the user will be allowed by virtue of purchasing the package. For example, for an original \$29 purchase price, a word processing program might allow the user 40 hours of use --
5 enough time to learn the program and get some useful work done but not enough to accommodate intensive daily use. Then, whenever the user uses the software package, the software will first check with the SoftMeter device to
10 ensure that the product has already been registered for use on that computer. If so (i.e., if the product number is found in the SoftMeter memory), the software package will proceed to operate normally. If not, a new registration process will be performed.

15 As the software is being used, it will periodically tally the amount of use (hours, pages, keystrokes, etc.) by writing an electronic "message" to the SoftMeter board. The particular choice for the "units-of-use" will be a matter for the software publisher to determine, based on
20 the publisher's own usage studies. Time, by itself, is not really appropriate, since many programs, though loaded into active memory and appearing on the display screen, actually lie idle for long periods of time while users tend to other business tasks, such as answering the phone. In practice,
25 the units-of-use will more likely be related to the end-product of the software, such as pages printed by a word processing program or some measure of actual activity, such as the number of records retrieved by a database program.

When the initial period of use is nearing expiration,
30 the SoftMeter device will so inform the user and ask if the user wishes to purchase additional units of use. If so, and confirmed with the user's password, the SoftMeter device will use the data modem to dial the 800 number for one of the many charge card service agencies and will
35 charge the user, for example, \$25 for another 100 hours use

of the program. The terms by which the user purchases additional units-of-use, i.e. the choice of units-of-use, the per-unit licensing fee, the minimum amount of purchasable units-of-use, are predetermined by the software publisher or licensing agent. When the charge is electronically approved, the additional amount of metered use is added to the use remaining in the SoftMeter device. This financial transaction occurs in exactly the same way (and uses the same existing 800 numbers and service providers) as does a retail purchase in which a clerk swipes a purchaser's charge card through a terminal adjacent to the cash register. In this case, however, the "merchant number" will be that of the software publisher (the "publisher's number" stored in the SoftMeter memory when the software was first installed).

In the most generic terms, the SoftMeter device consists of the following tangible elements, all of which must be in the control and possession of the user: Actualizing Device; Interchangeable Software; Non-tamperable, Persistent Storage Device; Interlock Device; and Purchase Transmission Device.

The Actualizing Device is a device that enables the consumer to manifest the beneficial use of the software. In the case of personal computer software, a computer with a SoftMeter device installed in it constitutes the actualizing device. For electronic books, the actualizing device is the viewing machine (e.g., the Sony Data DiscMan). For movies on video cassette, the actualizing device is the VCR. For video games, the actualizing device is the video game machine itself. An actualizing device without software provides no beneficial use to the consumer. Likewise, software without an actualizing device is of no beneficial use to the consumer.

The Interchangeable Software that is to be registered, licensed and metered in the SoftMeter system may take many

forms beyond the "computerese" meaning of "software." Naturally, computer programs are one kind of software, as are electronically, magnetically or optically recorded books. Software also includes recorded music, video game cartridges and recorded video tapes. The "computer software" that is inside appliances such as microwave ovens and VCR's is not the "software" that is metered by the SoftMeter system because it is not interchangeable. For example, interchangeable video game cartridges that give the game character fifteen different levels of gaming skill are "interchangeable software" but the software that gives a washing machine fifteen different wash cycles is not.

In addition, software whose use is purchased and metered by the SoftMeter system need not be distributed on tangible media (like floppy disks or CD-Rings). There may come a day when many kinds of software will be distributed over the phone (as Shareware is today) or over cable TV's coaxial cable. This simply brings the software into the consumer's possession and control. The SoftMeter system deals with paying for and metering the use of that software.

Another essential requirement for the SoftMeter device is a non-tamperable, non-volatile storage device, usually in the form of Random-Access Memory ("RAM"). That is, the SoftMeter accessory board must contain some electronic memory that cannot be altered by casual "hackers" and that will "remember" its contents even when the computer's power is turned off for weeks or months. There are several technologies that would meet these needs, the simplest being the use of a very low power RAM chip encapsulated in epoxy, along with a very long life lithium battery.

A non-tamperable, persistent storage device holds the identity and current amount of paid-for metered use for a large number of separate pieces of interchangeable software. In the PC accessory embodiment of the SoftMeter

system, this element is embodied in the RAM chips. In the CD-Ring embodiment discussed below, it is the magnetic ring laminated to the CD. This element is re-writable without practical limits. The storage device is persistent because
5 the latest information written to this element is retained in the absence of external power. The information may not be retained literally "forever" but for at least an order of magnitude of time longer than the typical metered units-of-use recorded and tracked therein. Also, non-
10 tamperability means that the average, technically astute consumer cannot employ commonly available means to alter the metering information. Physical or electrical inaccessibility, or clever encoding or encrypting may be used to achieve non-tamperability. For simplicity, we may
15 refer to the storage device as "secure."

The Interlock Device enables the actualizing device to manifest the beneficial use of the software to the consumer after he has paid for such use and prevents such beneficial use when the metered amount of use has been exhausted. The
20 interlock device must be capable of switching back and forth between enabled and disabled states. Thus, existing encryption-based distribution media and processes do not qualify as interlock devices because they use an encrypted CD-ROM plus a purchased decryption key to unlock the
25 software permanently, not just temporarily.

The Purchase Transmission Device transmits a binding financial purchase transaction in "computer-to-computer" form (that is, non-voice, non-graphic) from the consumer's location of beneficial use to the software copyright owner
30 or owner's agent before the interlock device will permit the use of the software. In both embodiments of the SoftMeter system, a data modem embodies the purchase transmission device. Because software registration and metered purchase transactions are conducted over the
35 telephone network, the SoftMeter device must be used in

conjunction with a data modem. Modems are a very popular personal computer accessory (particularly since the advent of FAX modems), and it is likely that the purchaser of a SoftMeter device would already have a modem. If not,
5 however, the SoftMeter device could be sold with an optional built-in modem.

The purchase transmission device must also operate on a pre-paid basis. In interactive, pay-per-view cable TV, the "cable box" that can transmit a movie purchase
10 transaction back over the cable to the cable operator's office qualifies as a purchase transmission device. However, the frequently proposed system whereby residential electricity meters can be "read" through a telephone connection between the meter and the electric utility is
15 not a purchase transmission device because it tallies the amount of the sale after the beneficial use of the commodity has already been consumed. Purchasing something in a scenario in which "operators are waiting for your call" does not qualify because the purchase transaction is
20 transmitted in voice form. Similarly, faxing an order form to a company also does not qualify because the transaction appears in an intermediate graphic form.

The invention can be better understood through reference to the drawings. FIG. 1 shows a schematic
25 representation of a simple embodiment of the SoftMeter device. The softmeter device 11 plugs into the actualizing device personal computer 12 containing the interchangeable software (not shown) by way of connectors 13. RAM chips 14 covered with epoxy provide the storage device powered by
30 dual lithium batteries 15. A purchase transmission device data modem (not shown) connects via socket 16. Many variations of the device are possible, including a portable version for use between computers and a miniaturized version for use with notebook computers. The accessory
35 board embodiment, provided as a factory-installed component

of VCR's, could also be applied to the pre-recorded video-cassette (movie) industry.

5 The SoftMeter device needs specialized software that "talks" to it in a very specific and controlled manner. No matter how well specified, interaction with the SoftMeter device cannot be left to the publisher's engineering staff to implement. Therefore, while the SoftMeter hardware device will be sold to the end-user at retail, there are also several software components that will be licensed to
10 participating software publishers for inclusion into their software products. These software components (or "modules") present to their enclosing software products a standardized and controlled interface to the SoftMeter device. These modules will constitute the "SoftMeter API"
15 (Application Programming Interface) and implement the three SoftMeter system processes of Registration, Metering and Purchase.

 When a software publisher agrees to participate in the SoftMeter system, the publisher will modify its existing
20 products to physically incorporate the SoftMeter API modules and to "call" ("request the services of") these modules at appropriate points in the operation of the software. The incorporation of the SoftMeter API into an existing product is represented schematically in FIG. 2.
25 An existing software product 20, having installation program code 11 and normal operating program code 22, can be modified by one with normal skill in the art of computer programming to incorporate the SoftMeter API 26. The modified software product 23 has installation program code
30 24 that incorporates the registration module 29 of SoftMeter API 26 and has normal operating code 25 that incorporates the purchase module 27 and the metering module 28 of SoftMeter API 26. The SoftMeter registration, purchase and metering modules are preprogrammed to interact

with the SoftMeter device and with the data modem as described below.

The overall SoftMeter process consists of the three distinct operations of Registration, Metering and Purchase.
5 These operations are described in detail below.

Registration of a newly installed software product uses the data modem to call the central clearinghouse, enters a new product into the SoftMeter device's RAM and sets the initial count for the amount of metered use.
10 Registration does not require financial transaction integrity control and takes only about one minute of real time to complete. The steps of the registration portion of the SoftMeter process are described below and are shown schematically FIG. 3.

- 15 1. The first part of a new software package 20 is transferred from a floppy disk 17 to the main memory 18 (CPU and RAM) of personal computer 12.
2. Part of the registration program checks with the SoftMeter device 11 as to whether the new software
20 product has already been registered (whether the software product's number is already present in the memory of the SoftMeter device 11).
3. When the SoftMeter device 11 reports that it doesn't "know" about this software product 20, SoftMeter 11
25 provides its own serial number, plus the name and address of the user, to the CPU 18 to be used to register the software.
4. The registration software uses the modem 19 to dial the number of the SoftMeter registration
30 clearinghouse.
5. The name and address of the user, along with the SoftMeter board's serial number, the software publisher's number and the software product's number,

are transmitted to the clearing house by way of phone line connector 30.

5 6. The initial amount of metered use (which may be adjusted upward for special promotions) is received and transferred, along with the publisher and product numbers, into the memory of the SoftMeter device 11.

10 7. The remainder of the installation process of the software package 20 is completed by transferring all of the software components to the computer's hard disk 31.

15 As suggested later with regard to electronic books, the registration process is not a necessary element of the SoftMeter system. It is a means for manifesting additional benefits from the use of the SoftMeter device. The registration process essentially notifies the software copyright owner (or his agent) of the identity of a new owner of a published copy of the copyrighted material. The registration process establishes possession but not beneficial use of the software. The registration process simply records the final link in the chain from author to publisher to distributor to retailer to consumer, where the consumer is identified not merely as a sales statistic but rather with some uniquely identifying information (name, account number, address, etc.).

25 The metering portion of the SoftMeter process tallies the consumer's beneficial use of the installed software by metering the "remaining use" counter down to zero from some prepaid quantity of authorized use. This counter is the "meter" that is maintained in the memory of the SoftMeter device. It is just like a parking meter in that, as long as time remains, the user is parked legally (he can use the software); when the time expires, the user gets towed away (use of the software is terminated). It is better than a parking meter, however, because the SoftMeter device will

remind the user when the remaining time is nearing zero, so that he can "put more money in the meter." ("Time" is used as the units of metering; however, the units of metering could just as well be pages, keystrokes, data records, searches or any other quantitative measure appropriate to the software product.)

The metering process is also responsible for giving the "OK" for the software to start operating; that is, if the software has never been registered, the metering process ensures that the software must first register itself before the user may use it. The metering operation makes no use of the data modem and occurs without delay at electronic speed. Furthermore, metering does not require strict integrity controls. The steps of the metering operation are described in more detail below and are shown schematically in FIG. 4.

1. The user starts up a software product in main memory 18 of computer 12 from the keyboard 32.
2. The software, through the metering program, first checks whether the product is registered with the SoftMeter device 11.
3. If the software is registered, the SoftMeter device 11 gives the "go ahead" for the software to run.
4. The rest of the software product's program is read from the computer's hard disk 31 into memory 18 and begins operating.
5. Periodically, the metering program notifies the SoftMeter device 11 to tally down its counter of remaining use.
6. When the counter nears zero, the SoftMeter device 11 advises the program that additional use should be purchased soon if the user wishes to continue to use the program. If the user wants to make a purchase,

the purchase process is performed. If not, the program continues operating until the counter reaches zero.

5 The purchase portion of the SoftMeter process is initiated whenever the "meter is running low" or whenever the user wants to "add more to the meter" in order to increase the count in the remaining use meter. Since the purchase process involves making a charge purchase on a credit card via a data modem, this process is subject to
10 the strictest integrity controls for electronic financial transactions. However, there is absolutely nothing new that is required; from the standpoint of the financial transaction service provider (any of the several credit card processing centers), there is no difference between
15 the telephonically transmitted message from a retail merchant's card-swipe terminal and an identical message received from the SoftMeter device. The purchase operation, which takes only about one minute, is described in more detail in the numbered steps below and is shown
20 schematically in FIG. 5.

1. The user agrees to purchase an additional amount of metered use by entering his password when prompted on the screen 33.
2. The user's password is verified against the one stored
25 in the SoftMeter device 11.
3. The publisher number, credit card number and other values needed for the transaction are retrieved from the memory of the SoftMeter device 11.
4. The modem 19 is directed to dial a credit card
30 transaction service center.
5. The credit card purchase transaction is transmitted by way of phone line connector 30 and is confirmed with an approval code.

6. The additional amount of usage that was purchased is added to the remaining use counter in the SoftMeter device 11.

5 The purchasing process uses the purchase transmission device to automate the transaction by computer-to-computer means to effect a purchase in advance of the right to access copyrighted material for beneficial use. The purchase is of a license to use the software for a specific, limited, automatically-countable amount of units-
10 of-use and must be effected in advance of use. The units-of-use can be units such as time, pages, keystrokes, articles, queries, viewings or plays, or could even be based on the value of the transactions that are processed: "for \$100, you may use this invoicing program to create an
15 unlimited number of invoices totaling up to \$100,000 in gross sales."

All of the elements thus far described constitute the SoftMeter system, so long as they are under the control and in the possession of the consumer. Thus, for example, pay-
20 per-view cable TV is not an embodiment of a SoftMeter system because the movies (the software) are not in the possession and under the control of the consumer. Thus, one of the most fundamental benefits of the SoftMeter is the benefit to the consumer of low-cost convenience and
25 accessibility. The consumer can have, for example, 100 software programs on his personal computer just in case he might need one particular program in a hurry. Or, the consumer can have 5000 electronic novels on his bookshelf or movies on his VCR so that he can read or watch whatever
30 suits his mood at any time. The consumer can also have a complete CD-ROM legal library in his living room for quick easy reference. The SoftMeter system allows the consumer to "have it all now" at an affordable price.

The benefits of the SoftMeter system to publishers, end-users, corporate users, dealers and the Shareware industry are many.

5 Publishers of software products have the most to gain from the SoftMeter system in terms of tangible, measurable benefits. This is fortunate because the publishers must "buy into" the SoftMeter system before it can become a commercial success. One benefit to publishers is that all economic incentives for end-users to make illegal copies of software are eliminated by the SoftMeter system, because 10 the cost of diskettes for illegal copies and an aftermarket "how-to" book is about \$29 to \$39, roughly equal to the projected retail price of SoftMeter system-compatible original products from the publisher. Thus, all users, 15 even the most casual and infrequent, will now purchase official, legal copies, and the number of unit sales (based on estimates of software piracy) will triple or quadruple.

Also, the publishers will get a complete registration record for every owner of their products, not just the 20% 20 who are presently diligent enough to send in their registration cards. They will even get a registration record from every illegal copy, because these copies won't run without first being registered through the SoftMeter device. Since upgrade packages (newer versions of a 25 product with more and better features) are an important source of revenue to publishers, the SoftMeter system will expand this source of revenue by a factor of 400%! In addition, by tracking the purchase of additional units of use, the publishers can develop finely tuned marketing 30 profiles of their customers, which can aid them in making a wide variety of strategic decisions. For example, if the number of purchases of additional units of use is high during the first three months of a new product's life cycle, it is clear that the product is likely to be very 35 popular and should receive an additional allocation of

marketing and engineering resources. On the other hand, if people buy the product, try it and don't buy more of it, that is an early warning sign or a leading indicator of a severe problem.

5 Furthermore, by reducing the economic cost for trying software, for example from \$400 to \$39, users will be far more encouraged to try new or competing software packages. Although publishers now use this approach to some extent with "competitive upgrade" promotions (to trade in a used
10 item for a brand new model and save money), these could be handled much more efficiently with the SoftMeter system. For example, if a first software package is registered in the SoftMeter device when the user installs a second software package, the user could be given extra hours of
15 use of the second program in order to encourage him to put the new package through its paces. Moreover, because the publishers would be assured of receiving a registration record for each purchaser of their products, they could implement a restricted support policy in a realistic
20 manner. Currently, because 80% of bona fide users fail to send in their registration cards, most publishers must provide customer service to all callers. A publisher might offer two pricing scales for its products: one that comes with free customer support and another that doesn't.
25 Whatever the approach, the SoftMeter system enables such schemes to be trackable, accountable and automatically maintainable.

 Finally, the greatest strategic importance of the SoftMeter system to publishers will be the gradual
30 conversion of the software publishing industry from a "repeat sale" cycle to a "continuing revenue stream" basis. As personal computer technology has advanced, publishers have released ever more powerful, feature-rich versions of their mainstream software applications (word processing,
35 spreadsheet, database, etc.). Presently, the average user

needs and uses only a small fraction of the available features, and, with tight economic times ahead, will increasingly decline to purchase yet one more upgrade containing powerful and exciting features that are, in fact, of little or no use to him. The publishers will thus find themselves challenged to get additional rounds of sales revenue from their huge installed base of users. The SoftMeter solves this forthcoming problem.

End-users of personal computer software products would receive primarily intangible benefits from the SoftMeter process. In fact, there is even a potential downside: if a user makes very intensive use of a software product, his cumulative purchases of units of use may exceed the dollar amount of that product's current retail price. In order to allow conventional retail pricing methods to coexist with the SoftMeter system, publishers would probably have to cap the cumulative purchase amount -- like a "rent-to-own" situation. Thus, after a user has purchased, for example, 1000 hours of use for a total cost of \$350, he would have unlimited use thereafter, thereby competing effectively with an ordinary full retail price purchase of, for example, \$300 to \$400.

On the other hand, if we define "end-users" as persons who acquire software for their personal use in a non-business environment and, additionally, as business persons who acquire software for overflow business use at home, the following benefits become likely: First and foremost is the simple reality that most such end-users do not purchase any software; they make illegal copies of it from packages "borrowed" from their place of business or from copies of copies received from friends. In this context, the inexpensive SoftMeter versions would likely be found much more desirable and well worth the price of, for example, \$29 to \$39. This would give the end-user a complete, up-to-date version of the software, along with the publisher's

full set of instruction manuals: fair value for the money invested.

5 However, the primary benefit to end-users is that the SoftMeter system makes it possible to realize the grand promise of the CD-ROM: cheap, abundant access to information. (Recall that a CD-ROM cannot be economically copied.) With the SoftMeter device, an end-user can now buy a complete encyclopedia, a complete law library or a complete set of all of the cardiology journals published in 10 the last 50 years, each for just \$29. It is likely, particularly with appropriate marketing of the SoftMeter concept, that this single benefit would sway the end-user into embracing the system, to the complete exclusion of the existing software distribution mechanisms.

15 It should also be noted that the SoftMeter approach preserves and enhances the satisfaction of the retail purchase experience (an American cultural tradition). Astute marketing analysts have noted that alternate means of software distribution (like the data superhighway and 20 CD-ROM samplers) deny a customer the satisfaction of wandering through an attractively designed store, feeling the bulk of the box as he peruses the colorful descriptions of the features, and bringing home and unwrapping the proud and coveted purchase. Illegally copying software, while 25 certainly appealing to many, is still an essentially guilt-ridden activity, justified only by the difference between the retail price of the software and the value that the user expects to receive. The SoftMeter system brings all of those "outrageously priced" \$400 software products 30 within easy economic reach of the most starving student, while still distributing the products through traditional retail channels.

Corporate users of software products would also benefit from the SoftMeter system. The majority of 35 software revenue is produced from sales to businesses.

Business decision makers are quite comfortable with the concepts of leasing, renting and contracting for the limited use of something, the idea that an asset that is used intensively costs more to maintain than one that is used infrequently, and the idea of expenses being trackable and accountable. Thus, the business user is already both educated and predisposed to understand and appreciate the value of the SoftMeter system. Additionally, the SoftMeter system will also be developed as a networked product, i.e., rather than having an individual SoftMeter device in each PC, one "family size" SoftMeter device (and one modem) will be placed into the file server on the local area networks. This version of the SoftMeter system will also incorporate a greatly expanded capability for reporting on the level of software usage throughout the company. It will be able to report, for example, that "Mary in Accounting used Lotus 123 a total of 200 hours during the month of March." (Perhaps this indicates that Mary needs an assistant or that she could benefit from a bigger computer or a faster printer. It may also indicate that Mary needs to be trained in how to use Lotus more efficiently!)

With these considerations in mind, the first and foremost benefit to corporate users is that the SoftMeter system would provide trackable, accountable, "hard numbers" on the extent of software use throughout the company. This information would enable much more effective decisions to be made in the areas of equipment purchase, the allocation of training and internal customer support resources, and PC-related expense budgeting. In addition, there would be a budgetary incentive (or, more precisely, the lack of a disincentive) to acquire many additional software packages that might be of major benefit in limited use situations. That is, business users are frequently denied purchase requisitions for products that have limited use; with the SoftMeter system, the benefits of such packages could be

fully gained, if only for the few-day duration of a special project, since the cost would be proportional to the use.

5 The SoftMeter system does not provide a great deal of tangible benefit to retail dealers. Ideally, a retail software package would have the dealer's identification number encoded into the software product's installation disk, so that the dealer could receive a sales commission on further purchases of units of use. However, this is likely to be practical only for large volume mail order
10 houses and retail chains. In order to accommodate smaller retailers, the dealer's number could be attached to the outside of the retail package by the dealer himself. The number would be imprinted on a double-layer adhesive label, which the user would remove from the box and affix to the
15 floppy disk or CD-ROM after the user opened the package. The simple motivating force behind this procedure is that the initial amount of units-of-use to which the user will be entitled by virtue of his initial purchase will be enabled only by entering the dealer's number during the
20 registration process! Thus, smaller dealers and small software departments in general purpose stores will not be excluded from the benefits of the SoftMeter system.

 One such benefit to smaller dealers is dramatically increased return on inventory investment. Currently, for
25 example, dealers will invest about \$200 in a software package that they will sell for \$230 (software retailing is very competitive). With the SoftMeter system-compatible versions of software products, the dealer would invest only \$20 in a package that would be sold for \$30, with
30 additional commission revenue to follow. Also, because the number of software titles that could be stocked for a given inventory investment would be dramatically increased, it is likely that the SoftMeter approach would generate a greater volume of foot traffic for the retailer.

Another beneficiary of the SoftMeter system is the Shareware industry, which is a segment of the general software industry that accounts for only about five percent of total software revenues. It distributes its software products through "bulletin board" systems (which is like electronic mail that anyone can read) and cheap (about \$5 to \$10) collections on floppy disks or CD-ROMs. Users are encouraged to copy the software for friends and colleagues. For revenue, the industry depends entirely on the honor system: if a user uses a product that he believes useful, he is encouraged, as a matter of ethics, to mail a small check (\$15 to \$25) to the author of the product. Traditional incentives for doing so include an offer to receive the latest version plus a printed user's guide. Obviously, the SoftMeter system would serve the Shareware industry as an eminently fair mechanism of enforcement -- if a user really made substantial use of a product, the SoftMeter device would require him to eventually pay a bit of money for the benefits received.

A second embodiment of the SoftMeter device applies to the Compact Disc Read Only Memory (CD-ROM) media. This embodiment requires a new form of CD-ROM media, called the "CD-Ring," shown in FIG. 6. The CD-Ring 35 is a combination of a magnetic stripe 36, similar to one found on the back of a credit card, laminated to the aluminized laser-readable media 38 as found on a standard CD-ROM. In contrast to the PC-accessory embodiment of the SoftMeter device, which contains a small amount of random access memory (RAM) on a computer add-in card, the CD-Ring media provides the persistent and non-tamperable memory in the form of the laminated magnetic recording stripe 36. As with the accessory board embodiment of the SoftMeter device, non-tamperability means that the average, technically astute consumer cannot employ commonly available means to alter the memory. Physical or

electrical inaccessibility, or clever encoding or encrypting may be used to achieve non-tamperability. For example, if the magnetic ring on a CD-Ring were compatible with an industry standard floppy disk drive (CD-ROMs are the same physical size as 5¼" floppy disks), it would not qualify as non-tamperable. However, if CD-Ring drives were not sold to the retail consumer as general purpose computer accessories complete with control software and detailed technical specifications, then the CD-Ring media would effectively be tamperproof by the average, technically astute consumer.

The CD-Ring embodiment of the SoftMeter device can be applied to the recorded music industry and the video game industry and is particularly applicable to the publishing of "electronic books" that are readable with a portable viewing device, such as the Sony Data DiscMan. The Data DiscMan is a portable device, smaller and lighter than a typical hard-bound book, containing a CD-ROM player and a Liquid Crystal Display (LCD) panel. A Data DiscMan that is able to utilize the CD-Ring media and has a built-in modem embodies the SoftMeter device in its most portable, mass market form. A CD-ROM drive can be enabled for use with the CD-Ring media, as shown in FIG. 7, by being manufactured with an additional, off-the-shelf magnetic recording and playback head 40 that is attached to the existing laser-optical playback head 41, for example, by way of a flexible mounting bracket 43, both of which heads are actuated by drive screw 42. This new playback device is called a "CD-Ring reader." New models of electronic book readers (like the Data DiscMan) can be designed and manufactured in such a fashion, without requiring a breakthrough in technology. A simple modem can be added to the modified electronic book reader, using off-the-shelf devices, in order to embody a SoftMeter device.

When an electronic book consumer first purchases a CD-Ring viewer (such as the modified Sony Data DiscMan), it will ask him to enter his charge account information, quite similar to the process used when the PC accessory card embodiment of the SoftMeter device is first installed. Then, for example, instead of buying one paperback book for \$5 or one hardbound book for \$20, customers will receive about 100 books on each CD-Ring disc for a retail price of about \$5. Each book will have its product number and price written onto the magnetic stripe, along with an initial license to read the first few chapters (or, for example, the first 50 pages). The consumer will be free to browse the first part of each book in an unrestricted manner. When a consumer decides that he wants to read all of the book, he will just press a "purchase" button on the viewer. The reader will give instructions on its LCD display and will ask the consumer to plug the viewer into a phone line and confirm the purchase by entering a password. The resulting financial transaction occurs as discussed above regarding the SoftMeter purchase process, similar to retail purchases, except that the merchant number will be that of the book publisher, recorded on the magnetic stripe at the time the CD-Ring was manufactured. When the purchase transaction is completed, the viewer will record the authorization to read the remainder of the book directly onto the magnetic stripe. At the same time, it will remove the authorization that enabled the first part of the book to be viewed (allowing for some overlap of authorized pages). This process is appropriate for general fiction and non-fiction books. For reference books, like encyclopedias, the metering will be done not in terms of access to pages but will be based on viewing time or on number of pages viewed. These variations are similar to those described for the PC computer program application of the SoftMeter system.

As applied to electronic books on CD-Ring media, the SoftMeter metering and purchasing processes are essentially the same as those described above regarding software, except that the "non-tamperable, persistent storage" is provided by the ring of magnetic recording material 36 laminated to the CD, rather than by memory chips inside the playback device. In the context of electronic books, the SoftMeter registration process is not critical and may be skipped at the option of the publisher.

The benefits of the SoftMeter system for both new and established authors are substantial and simple. For established authors, the SoftMeter system would provide them with royalties every time their books are read. For new authors, the SoftMeter system provides an unprecedented opportunity to "be discovered."

Book publishers would benefit from the SoftMeter system in a number of ways. For example, by "piggy-backing" new authors' works on the same CD-Ring as those of established authors, publishers would be able to promote many more new authors at no increase in cost. Or, by grouping a popular author's works onto a single CD-Ring (such as all of Agatha Christie's mysteries), publishers would overcome the deficiencies of the distribution system. That is, once a reader has found an enjoyable author, the reader would have immediate access from that publisher to more works by the same author. Also, publishers would gain immediate feedback on the popularity of new authors and new works, because the SoftMeter system purchase process evidences the consumer's commitment to read, rather than his earlier decision to acquire. The SoftMeter system purchase process also eliminates the distortion introduced by the vast numbers of books that are sitting idle in the distribution pipeline.

Consumers would benefit in several significant ways. Since the cost of manufacturing and distributing a book on

the CD-Ring media is vastly cheaper than conventional paper, consumers would pay less per book. In addition, the accessibility of books would be greatly enhanced. A few CD-Rings bought for \$5 each would bring an entire book store department into the consumer's living room. Finally, the consumer would enjoy all the benefits of that tried-and-true sales technique: "Try it in the convenience of your own home for 15 days. If you're not completely satisfied"

As a result of this invention, book retailing, in its current form of the "neighborhood book store" would probably disappear. The simple economics of scale (the ability to contain an entire book store in a few linear feet of shelf space) would make even the smallest "paperback rack" at the supermarket nearly the equivalent of an entire book store. In addition, mail order distribution, such as book of the month clubs, would likely flourish in the form of "CD-Ring of the month clubs." However, rather than an "on approval" approach, they would probably adopt a subscription format. A consumer could subscribe to the "New York Times Bestsellers Disc" or the "Unknown Science Fiction Authors Disc," etc.

In the area of college texts alone, in which books have been traditionally "recycled" by local dealers, the economics of CD-Rings and the SoftMeter system would eliminate these dealers by making the net price of an entire year's textbooks less than the current "used" price. Furthermore, probably half or more of all book manufacturers (those entities that actually print and bind books under contract to publishers) would go out of business. These businesses would be replaced by companies that manufacture and package CD-Rings. Similarly, the manufacturers of printing inks and paper would see a dramatic drop in the segments of their business that currently supply the book manufacturers. On the other

hand, the suppliers of the plastics used in the manufacture of CD-Rings would see a dramatic increase in their business. Furthermore, as a result of the economics of size (a cubic yard of books will now fit into a few cubic inches of CD-Ring), book shipping and warehousing operations will experience a substantial decline in business. On the other hand, there would probably be an increase in "rack jobbers" serving general retail establishments.

10 In between the two embodiments of the SoftMeter device described above, one using entirely off-the-shelf technology and the other embodying a new software storage medium, lie countless alternatives. For example, the secure storage means might be embodied in the newer "flash" memory chips, or by storing the data in encrypted form on the existing hard disk inside the users computer.

The transmission means might be embodied through radio frequency (RF) signals sent over the coaxial cable of a cable TV network. It might also be embodied in a two-phase approach, whereby an infra-red signal from an electronic book viewer would be received by a cable TV converter box, and subsequently transmitted over the coaxial cable. Or it could use digital cellular phone technology (particularly in the book viewer application, where portability is a factor.)

For convenience and portability, the entire SoftMeter device (as applied to personal computers) might be contained in a box that is external to the main computer chassis and connected to it by a wire cable or by infra-red signals.

The secure storage means of the SoftMeter device could also be embodied in one of the "credit card" memory cards, which would carry the user's identity and licensed usage counts to whatever computer in which the card was plugged.

Again for convenience, and particularly for portability, an electronic book viewer embodiment of the SoftMeter device might be implemented in a two-part mechanism, consisting of (1) a hand-held portable viewer, with minimal built-in secure storage means, and (2) a desk-top "docking station" that would contain a battery charging circuit, a data modem (or other transmission means) and additional secure storage. In this "docking station" embodiment, it would be feasible to allow the portable book viewer to manifest beneficial use "on credit" (without pre-purchase), since the viewer would eventually need to be plugged back into the docking station for recharging, at which time the stored "purchase on credit" would be transmitted by the modem in the docking station (before recharging would commence).

It is also likely, given the direction of technological advances, that it will be more commercially attractive to use the "memory chip and lithium battery" secure storage means in electronic book viewers, rather than incurring the need to ramp up manufacturing facilities for the CD-Ring media.

Thus, an apparatus and method for controlling the registration, licensing and usage of software products is provided. One skilled in the art will appreciate that the present invention can be practiced by other than the described embodiments, which are presented for purposes of illustration and not limitation, and the present invention is limited only by the claims that follow.

WHAT IS CLAIMED IS:

1. A registration interlock system for securely controlling the registration of computer software stored on interchangeable media, comprising:

5 a computing device;

secure storage means connected to said computing device or to said media;

product code contained in said software that uniquely identifies said software and a licensing agent of said
10 software;

user identification information input by a user to said computing device;

registration data collection means connected to said computing device for gathering said user identification
15 information from said computing device and for extracting said product code from said software;

transmission means for securely transmitting said user identification information and said product code to said software licensing agent;

20 data recording means for recording said user identification information and said product code into said storage means upon successful completion of said transmission; and

interlock means connected to said computing device for
25 enabling said software to operate on said computing device when said product code is found in both said software and said storage means, and for disabling said software from operating on said computing device when said product code is not found in said storage means;

30 whereby said computing device, upon each attempt by a user to operate said software on said computing device for said user's benefit, engages said interlock means to

enable or disable the operation of said software on said computing device;

whereby, if said software is disabled by said interlock means from operating on said computing device, said computing device engages said registration data collection means to gather said user identification information from said computing device and to extract said product code from said software, engages said transmission means to transmit said user identification information and said product code to said software licensing agent, and, upon successful completion of said transmission, engages said data recording means to record said user identification information and said product code into said secure storage means, thereby registering said user with said software licensing agent; and

whereby said software is automatically registered to said user with said software licensing agent before said software will operate on said computing device for said user's benefit, and whereby such registration occurs without regard for the methods or means by which said user came into possession of said software.

2. The system of claim 1 wherein said computing device comprises one of the group comprising a general purpose personal computer, a personal interactive video game machine or an electronic book viewer.

3. The system of claim 1 wherein said secure storage means comprises an epoxy encapsulated RAM chip.

4. The system of claim 1 wherein said secure storage means comprises:

optically readable digital data storage medium;
magnetically readable and writable digital data storage medium;

wherein said optically readable medium is coaxially bonded to said magnetically readable and writable medium to form a combined medium; and

5 wherein said combined medium rotates as a single entity for the purpose of recording onto said magnetically readable and writable medium information identifying a currently licensed user and said currently licensed user's licensed rights to use the data that is currently being read from said optically readable medium.

10 5. The system of claim 1 wherein the transmission means comprises a data modem connected to a telephone line.

6. The system of claim 1 wherein said interchangeable media, said computing device, said secure storage means, said registration data collection means,
15 said transmission means, said data recording means and said interlock means are all in the possession of said user.

7. A system for securely controlling the paid licensing and metered usage of computer software stored on interchangeable media, comprising:

20 a computing device;

secure storage means connected to said computing device or to said media;

product code contained in said software that uniquely identifies said software and a licensing agent of said
25 software;

purchase terms contained in said software that describe the units-of-use and enumerate the predetermined licensing fee and license terms established by said software licensing agent for the licensed use of said
30 software;

user purchase account information input by a user to said computing device;

purchase data collection means connected to said computing device for gathering said user account information from said computing device, for extracting said product code and said purchase terms from said software,
5 and for displaying same to said user;

transmission means for securely transmitting to said software licensing agent a legally binding purchase contract between said user and said software licensing agent for the rights of said user to use said software for
10 a contracted amount of said units-of-use in consideration of said predetermined licensing fee;

data recording means for recording said product code and said contracted amount of units-of-use into said storage means upon successful completion of said
15 transmission;

metering means connected to said computing device and to said software for effectuating a count of the beneficial use of said software by said user in terms of said units-of-use as said units-of-use are manifested to said user,
20 and for further tallying said count of beneficial use of said software by said user against said contracted amount of units-of-use by reducing said contracted amount of units-of-use by said count of beneficial use of said software by said user to thereby yield an amount of
25 remaining units-of-use; and

interlock means connected to said computing device for enabling said software to operate on said computing device when said product code is found in said storage means and when said amount of remaining units-of-use is greater than
30 zero, and for disabling said software from operating on said computing device either when said product code is not found in said storage means or when said amount of remaining units-of-use is zero;

whereby said computing device, upon activation by a user of said software to operate said software on said computing device, repeatedly engages, in turn, said interlock means and said metering means to control whether
5 or not the operation of said software on said computing device should be further enabled;

whereby said computing device, either at the request of said user or when said amount of remaining units-of-use approaches or reaches zero, engages said
10 purchase data collection means to gather said user account information from said computing device, to extract said product code and said purchase terms from said software and to display same to said user, solicits predetermined legal authorization from said user for said purchase terms, and,
15 if so authorized, engages said transmission means to transmit said legally binding purchase contract to said software licensing agent, and, upon successful completion of said transmission, engages said data recording means to record said contracted amount of units-of-use into said
20 secure storage means, thereby purchasing for said user said contracted amount of units-of-use of usage rights from said software licensing agent; and

whereby licensed usage rights to said software can be repeatedly purchased by said user in an automated
25 manner from said software licensing agent in terms of said units-of use in advance of said beneficial use of said software on said computing device by said user, and whereby the consumption of said licensed usage rights is counted in terms of said units-of-use and tallied against the
30 purchased amount of said usage rights, thereby preventing said user from receiving beneficial use of said software in excess of said purchased amount of said usage rights.

8. The system of claim 7 wherein said computing device comprises one of the group comprising a general

purpose personal computer, a personal interactive video game machine or an electronic book viewer.

9. The system of claim 7 wherein said secure storage means comprises an epoxy encapsulated RAM chip.

5 10. The system of claim 7 wherein said secure storage means comprises:

optically readable digital data storage medium;

magnetically readable and writable digital data storage medium;

10 wherein said optically readable medium is coaxially bonded to said magnetically readable and writable storage medium to form a combined medium; and

15 wherein said combined medium rotates as a single entity for the purpose of recording onto said magnetically readable and writable medium information identifying a currently licensed user and said currently licensed user's licensed rights to use the data that is currently being read from said optically readable medium.

20 11. The system of claim 7 wherein the transmission means comprises a data modem connected to a telephone line.

25 12. The system of claim 7 wherein said interchangeable media, said computing device, said secure storage means, said purchase data collection means, said transmission means, said data recording means, said metering means and said interlock means are all in the possession of said user.

13. The system of claim 7 further comprising:

user identification information input by a user to said computing device;

30 registration data collection means connected to said computing device for gathering said user identification

information from said computing device and for extracting said product code from said software;

5 said transmission means further comprising means for securely transmitting said user identification information and said product code to said software licensing agent; and

 data recording means for recording said user identification information and said product code into said storage means upon successful completion of said transmission;

10 whereby said computing device, upon each attempt by a user to operate said software on said computing device for said user's benefit, engages said interlock means to enable or disable the operation of said software on said computing device;

15 whereby said computing device, if said software is disabled by said interlock means from operating on said computing device due to said product code not being found in said storage means, engages said registration data collection means to gather said user identification
20 information from said computing device and to extract said product code from said software, engages said transmission means to transmit said user identification information and said product code to said software licensing agent, and, upon successful completion of said transmission, engages
25 said data recording means to record said user identification information and said product code into said secure storage means, thereby registering said user with said software licensing agent; and

 whereby said software is automatically registered
30 to said user with said software licensing agent before said licensed usage rights to said software can be purchased by said user and before said software will operate on said computing device for said user's benefit, and whereby such

registration occurs without regard for the methods or means by which said user came into possession of said software.

14. A digital data storage medium comprising:

optically readable digital data storage medium; and

5 magnetically readable and writable digital data storage medium;

wherein said optically readable medium is coaxially bonded to said magnetically readable and writable medium to form a combined medium; and

10 wherein said combined medium rotates as a single entity for the purpose of recording onto said magnetically readable and writable medium information identifying a currently licensed user and said currently licensed user's licensed rights to use the data that is currently being
15 read from said optically readable medium.

15. A method for securely controlling the registration, paid licensing and metered usage of computer software on a computing device having secure storage means, said computer software containing a product code that
20 uniquely identifies said software and a licensing agent of said software and further containing purchase terms describing the units-of-use, said computer software being stored on interchangeable media, the method comprising the steps of:

25 inputting by a user of user identification information and user account information to said computing device;

gathering said user identification information and said user account information from said computing device;

30 extracting said product code and said purchase terms from said software;

displaying said user account information, said product code and said purchase terms to said user;

securely transmitting to said software licensing agent
a legally binding purchase contract between said user and
said software licensing agent for the rights of said user
to use said software for a contracted amount of said units-
5 of-use in consideration of a predetermined licensing fee,
thereby purchasing for said user said contracted amount of
units-of-use of usage rights from said software licensing
agent;

10 recording said product code and said contracted amount
of units-of-use into said storage means upon successful
completion of said transmission;

effectuating a count of the beneficial use of said
software of said user in terms of said units-of-use as said
units-of-use are manifested to said user, and further
15 tallying said count of beneficial use of said software by
said user against said contracted amount of units-of-use by
reducing said contracted amount of units-of-use by said
count of beneficial use of said software by said user to
thereby yield an amount of remaining units-of-use; an

20 interlocking said computing device, upon activation by
a user of said software to operate said software on said
computing device, by enabling said software to operate on
said computing device when said product code is found in
said storage means and when said amount of remaining units-
25 of-use is greater than zero, and by disabling said software
from operating on said computing device either when said
product code is not found in said storage means or when
said amount of remaining units-of-use is zero;

whereby said user can repeatedly purchase
30 licensed usage rights to said software in an automated
manner from said software licensing agent in terms of said
units-of use in advance of said beneficial use of said
software on said computing device by said user, and whereby
the consumption of said licensed usage rights is counted in

terms of said units-of-use and tallied against the purchased amount of said usage rights, thereby preventing said user from receiving beneficial use of said software in excess of said purchased amount of said usage rights.

5 16. The method of claim 15 wherein said step of securely transmitting comprises transmitting over a data modem connected to a telephone line.

17. The method of claim 15 wherein said computing device comprises one of the group comprising a general
10 purpose personal computer, a personal interactive video game machine or an electronic book viewer.

18. The method of claim 15 wherein said secure storage means comprises an epoxy encapsulated RAM chip.

19. The method of claim 15 wherein said secure
15 storage means comprises:

optically readable digital data storage medium;

magnetically readable and writable digital data storage medium;

20 wherein said optically readable medium is coaxially bonded to said magnetically readable and writable medium to form a combined medium; and

25 wherein said combined medium rotates as a single entity for the purpose of recording onto said magnetically readable and writable medium information identifying a currently licensed user and said currently licensed user's licensed rights to use the data that is currently being read from said optically readable medium.

20. The method of claim 15 further comprising, prior to said step of displaying said user account information,
30 said product code and said purchase terms to said user, the steps of:

securely transmitting said user identification information and said product code to said software licensing agent, thereby registering said user with said software licensing agent;

5 recording said user account information and said product code into said storage means upon successful completion of said transmission; and

interlocking said computing device, upon each attempt by a user to operate said software on said computing device for said user's benefit, by enabling said software to
10 operate on said computing device when said product code is found in both said software and said storage means, and by disabling said software from operating on said computing device when said product code is not found in said storage
15 means;

whereby said user must register said software with said software licensing agent before said software will operate on said computing device for said user's benefit, and whereby such registration occurs without
20 regard for the methods or means by which said user came into possession of said software.

21. The method of claim 20 wherein said step of securely transmitting comprises transmitting over a data modem connected to a telephone line.

25 22. A method for securely controlling the registration, paid licensing and metered usage by a user of computer software on a computing device having storage means, input means, display means, registration means for registering said software with a licensing agent of said
30 software, and metering means for effectuating a count of units-of-use of beneficial use of said software by said user as said units-of-use are manifested to said user and for effectuating a count of an amount of remaining units-of-use, said computer software having a product code that

uniquely identifies said software and said software licensing agent, said method comprising the steps of:

inputting said software into said storage means of said computing means by way of said input means;

5 verifying that said amount of remaining units-of-use is greater than zero;

counting the amount of beneficial use of said software by said user in terms of said units-of-use as said units-of-use are manifested to said user;

10 metering said amount of remaining units-of-use as said units-of-use are manifested to said user;

purchasing by said user of a contracted amount of units-of-use from said software licensing agent and adding said contracted amount of units-of-use to said amount of remaining units-of-use; and

15

allowing the operation of said computer software on said computing means until said amount of remaining units-of-use equals zero.

23. The method of claim 22 wherein said step of metering said amount of remaining units-of-use further comprises the steps of:

20

effectuating a count of said amount of remaining beneficial use of said software by said user in terms of said units-of-use; and

25 tallying said count of beneficial use of said software by said user against said contracted amount of units-of-use by reducing said contracted amount of units-of-use by said count of beneficial use of said software by said user to thereby yield an amount of remaining units-of-use.

30 24. The method of claim 22 further comprising, prior to said step of purchasing by said user, the step of notifying said user of said tally of amount of remaining

units-of-use as said meter of amount of remaining units-of-use nears or reaches zero.

25. The method of claim 24 wherein said step of notifying said user of said tally of remaining amount of
5 comprises notifying said user by way of said display means.

26. The method of claim 22, said computer software further containing purchase terms that describe the units-of-use and a predetermined license fee, wherein said step of purchasing by said user of a contracted amount of units-of-use from said software licensing agent comprises the
10 steps of:

inputting by said user of user purchase account information to said computing device;

extracting said product code from said software;

15 securely transmitting to said software licensing agent, based upon said user purchase account information, a legally binding purchase contract between said user and said software licensing agent for the rights of said user to use said software for a contracted amount of said units-of-use in consideration of a predetermined licensing fee,
20 thereby purchasing for said user said contracted amount of units-of-use of usage rights from said software licensing agent; and

recording said product code and said contracted amount
25 of units-of-use into said storage means upon successful completion of said transmission.

27. The method of claim 25 wherein said step of securely transmitting comprises transmitting over a data modem connected to a telephone line.

30 28. The method of claim 22 further comprising, prior to said step of verifying that said amount of remaining units-of-use is greater than zero, the steps of:

inputting by said user of user identification information to said computing device;

extracting said product code from said software;

5 securely transmitting to said software licensing agent said user identification information and said product code, thereby registering said user with said software licensing agent.

29. The method of claim 28 wherein said step of
10 securely transmitting comprises transmitting over a data modem connected to a telephone line.

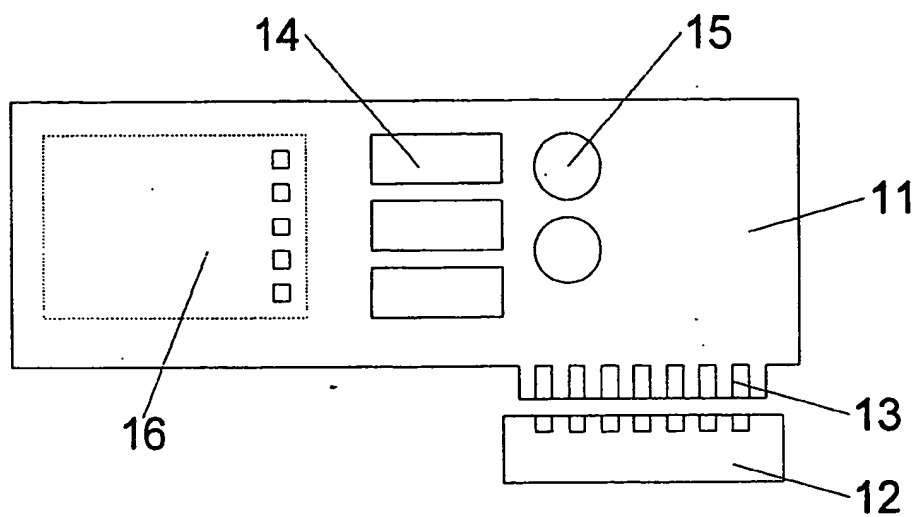


Figure 1

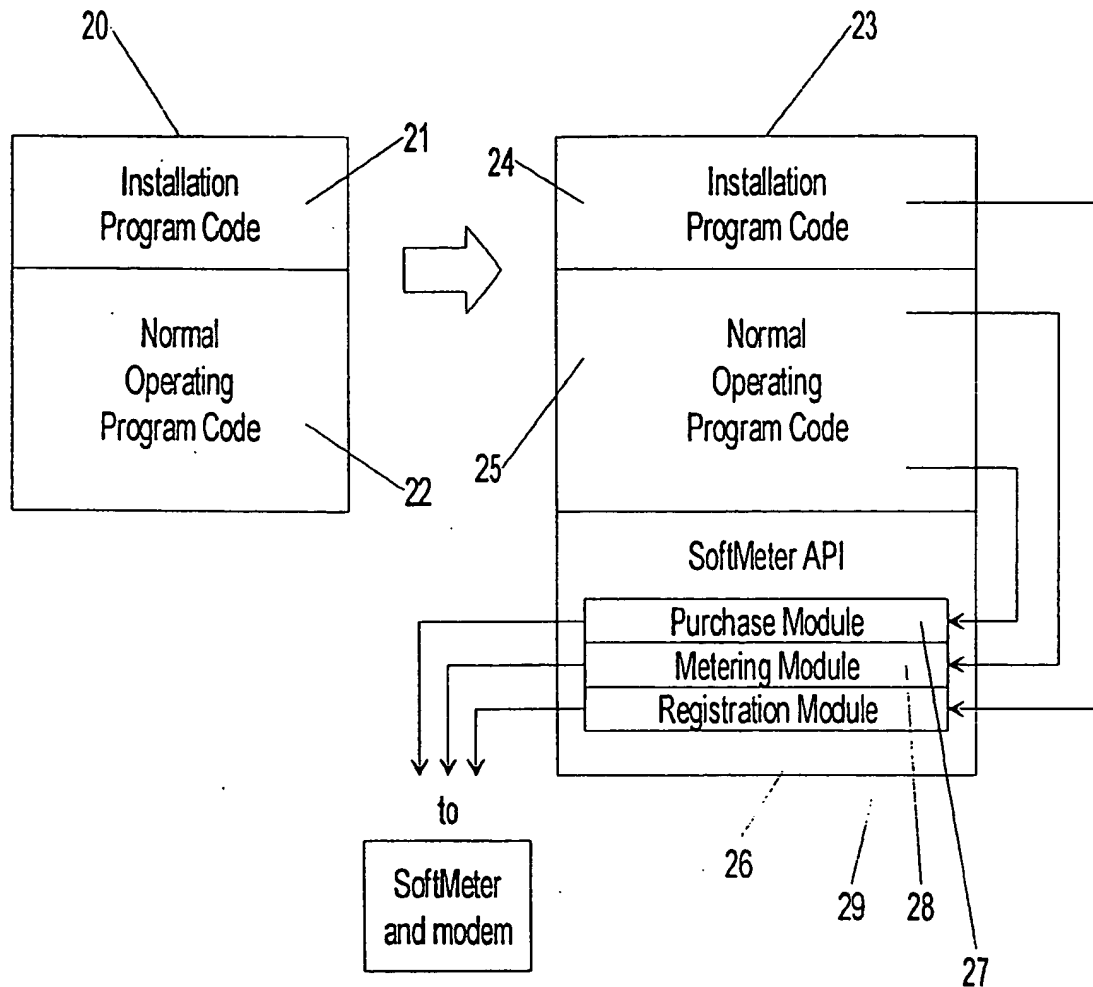


Figure 2

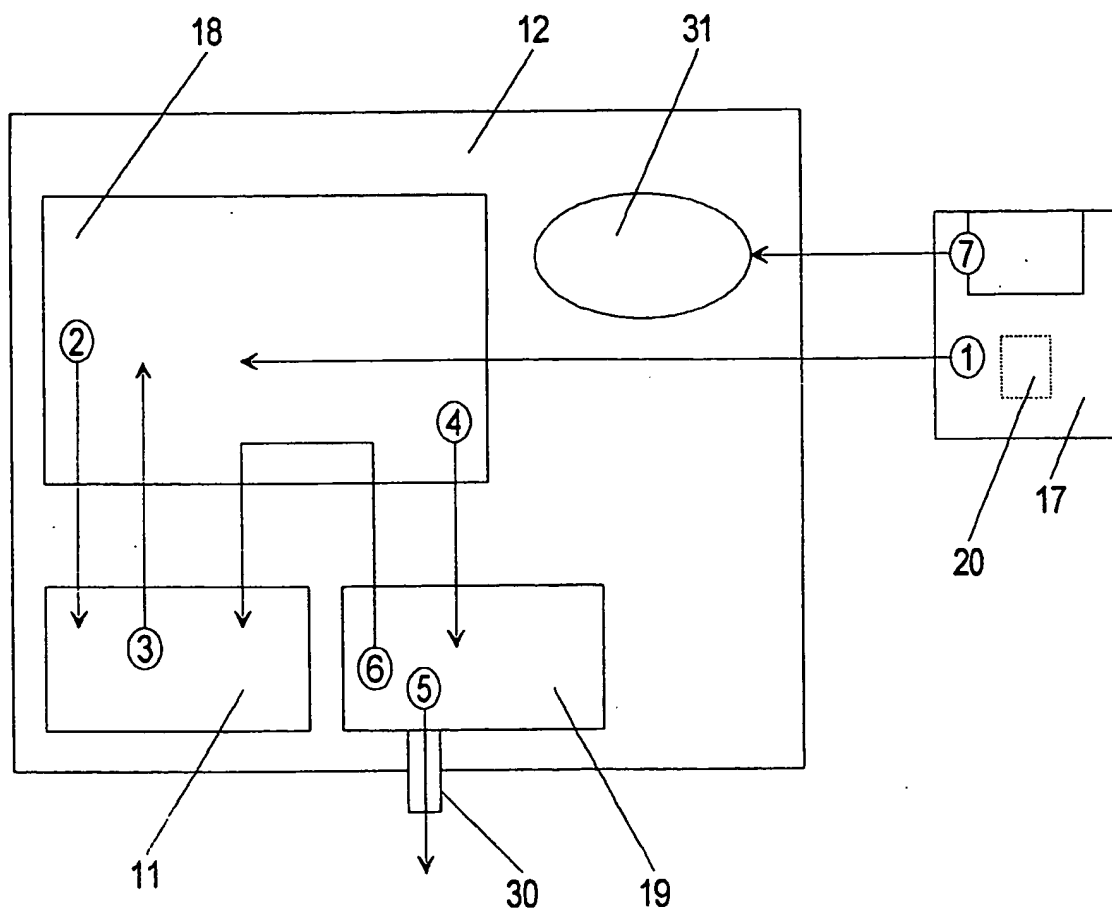


Figure 3

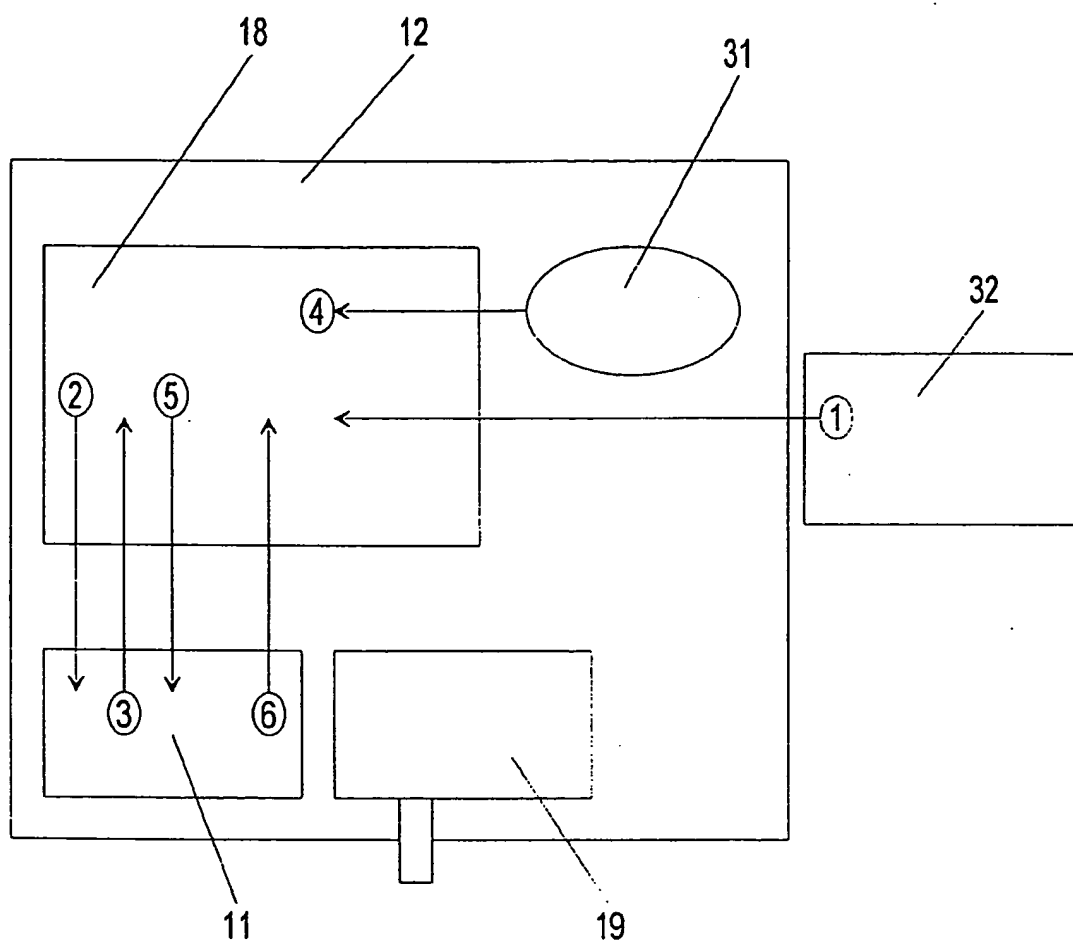


Figure 4

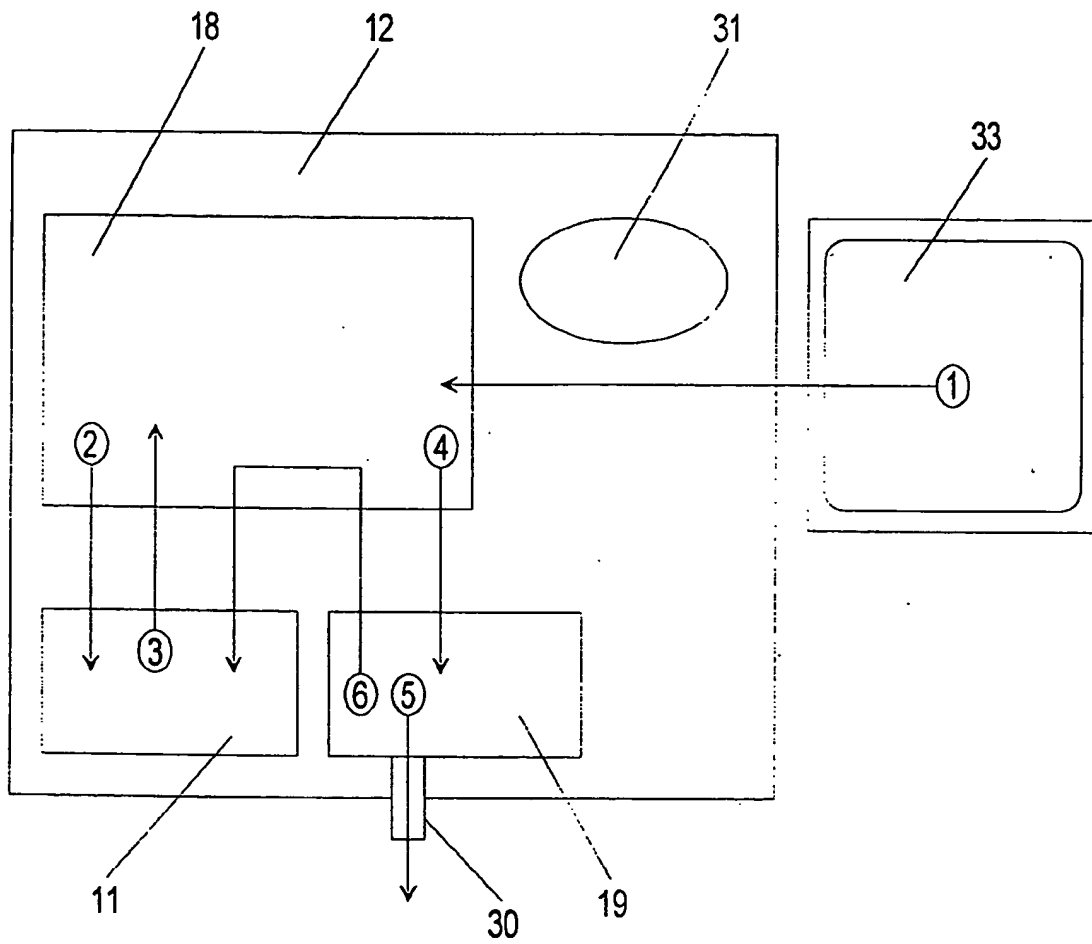


Figure 5

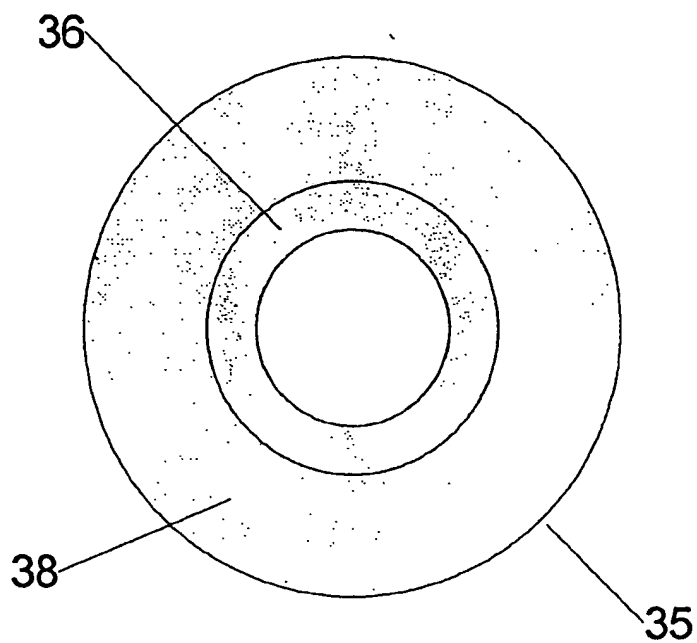


Figure 6

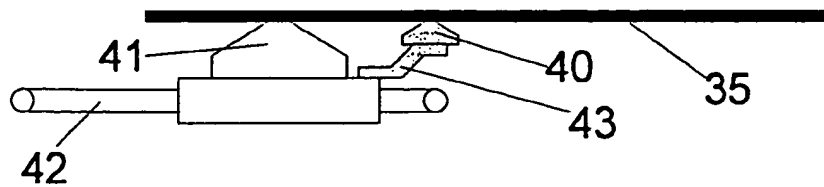


Figure 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/07587

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G06F 9/44, 9/445
US CL : 364/401

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 364/401; 395/200, 550, 700

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	US, A, 5,388,211 (HORNBuckle) 07 February 1995, col. 3, line 16 to col. 4, line 32	1, 5, 7, 1-1, 14, 15, 16, 21, 22, 27, 29
A	US, A, 5,138,712 (CORBIN) 11 August 1992, see Abstract.	1, 7, 14, 15, 22
Y	US, A, 5,014,234 (EDWARDS, JR.) 07 May 1991, col. 1, line 8 to col. 2, line 32; col. 5, line 8 to col. 8, line 46.	1-29
A	US, A, 4,796,220 (WOLFE) 03, January 1989, see Abstract.	1-29

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	* T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
* A* document defining the general state of the art which is not considered to be part of particular relevance	* K* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
* E* earlier document published on or after the international filing date	* Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
* L* document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	* A* document member of the same patent family
* O* document referring to an oral disclosure, use, exhibition or other means	
* P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 27 JULY 1995	Date of mailing of the international search report 25 SEP 1995
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-9731	Authorized officer <i>B. Handley</i> GAIL O. HAYES Telephone No. (703) 305-9711